

Advancing Animal Disease Traceability

Overview & Synopsis



United States Department of Agriculture
Animal and Plant Health Inspection Service

Introduction

The ability to successfully trace an animal disease to its source is critical to the health and economic well-being of commercial livestock and poultry industries in the United States. A close review of the national traceability infrastructure reveals significant opportunities to advance the quality of animal identification data, and the efficient use of evolving technology solutions. This document outlines pre-harvest traceability advancement strategies that meet the needs of animal health officials, and the animal agriculture industry, in addition to maintaining the confidence of consumers and trading partners.

Current animal identification and data collection approaches typically address individual objectives, such as specific disease eradication programs, interstate commerce, breed registries, and age and source verification. An animal may be identified multiple times yet still not be fully traceable because separate programs use distinct herd and flock identification protocols. The result is a series of incompatible databases maintained by States, the private sector, and the USDA Animal and Plant Health Inspection Service Veterinary Services (APHIS VS) information technology infrastructure.

Common data standards can enable these separate databases to share location and animal identification data essential to disease control. This approach conserves time, money and effort by drawing from systems and data already in place. It also maintains the flexibility required to use animal

identification for multiple purposes, as needed by individual States, species/sectors, industry associations, and other entities.

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Defining Optimal Traceability

An optimal traceability infrastructure uses modern technologies to collect, store and make available data that animal health officials need to conduct animal disease surveillance, eradication and control programs. A highly reliable, complete and cost-effective information system equips officials to trace the movement of diseased animals, and identify and contain other potentially exposed animals. Fundamental to this system is accurate and accessible identification of as many animals as possible within a population.

USDA defines retrieval of traceback data within a 48-hour window as optimal for efficient, effective disease containment. Within this timeframe, animal health officials must have the data required to trace a disease back to its source and limit potential harm to animal agriculture, such as loss of producer income. This process may require the tracing of hundreds, even

The Cost of Animal Disease: Summary of Recent Outbreaks

Bovine Tuberculosis:

- Since 2002, detections in Arizona, California, Michigan, Minnesota, New Mexico and Texas have required the destruction of more than 25,000 cattle. A new detection in June in New Mexico will add to this total.
- USDA has spent approximately \$90 million on owner indemnification and control activities.
- Producers are financially affected by strict movement controls applied after new detections.
- Since 2004, USDA has tested 787,000 animals in response to TB outbreaks.

Exotic Newcastle Disease (2002):

- Confirmed in California and quickly spread to the neighboring states of Arizona, Nevada and Texas.
- Largest animal disease outbreak in the United States in 30 years. It took 10 months to eradicate the disease at a cost of \$160 million.
- Poultry producers, both commercial and backyard flock owners, lost 4 million birds during extensive depopulation activities.

Bovine Spongiform Encephalopathy (2003):

- USDA spent \$5 million on its epidemiology investigation, depopulation and initial response.
- The United States lost 80 percent of its foreign beef trade.
- As part of the effort to regain access to foreign markets, USDA spent approximately \$189 million on the enhanced BSE surveillance program.



Traceability: A Species/Sector Synopsis

A high-level summary of species/sectors illustrates how differences in management, transportation and marketing can affect traceability.

- **Swine** – About 95 percent of pork is produced by operations under contract with packing companies, and 80 percent is produced by commercially integrated businesses. Often, large numbers of swine move in groups to a single finishing location within the same management system prior to harvest. These factors contribute to a high level of traceability within the commercial swine industry.
- **Sheep and Goats** – This industry is composed primarily of independent producers and is not vertically

integrated. Participation in scrapie programs, however, has significantly improved the level of identification, resulting in a high degree of traceability.

- **Poultry** – The majority of poultry marketed in this country are part of an integrated production chain led by commercial interests. The industry, as a result, is able to trace when poultry was moved, the number moved, where they were moved from, and where they were moved to.
- **Beef Cattle** – Widespread diversification, distinct sectors along the production chain, and a lack of vertical integration create information challenges in the beef industry. These factors, along with decreased participation in previously

regulated disease programs, result in a declining population of officially identified beef cattle. Consequently, animal health officials find it more difficult to conduct timely and efficient tracebacks to disease events.

- **Dairy Cattle** – On the whole, the dairy industry is not vertically integrated. Management practices and participation in the Dairy Herd Improvement Association, breed registries, and genetic performance programs, however, have provided the industry with high levels of official identification that, when properly used, can improve disease traceability.

thousands of animals to multiple locations. The sooner reliable data is available, the sooner affected animals can be located, appropriate response measures can be established, and disease spread can be halted. The rapid movement of animals across great distances in today's industry complicates this process. Tracing may need to occur across State lines, borders, and species.

Traceability by Species/Sector

Traceability among some species/sectors is complicated by the fact that herd and flock identification protocols vary among current disease programs and are not based on common data standards.

For the most part, animal health officials have traditionally designed surveillance, eradication and control programs for specific diseases. These programs were developed in response to an existing or threatening disease outbreak. Using this approach, health officials have been and are very successful in containing and eradicating diseases. Examples include the

Cooperative State/Federal Brucellosis Eradication Program for cattle, the Pseudorabies Eradication Program for swine, and the National Scrapie Eradication Program for sheep and goats.

Advancing traceability must take into account the differences between species and sectors, and the availability of identification data that results from management, transportation and marketing practices.

The Role of the National Animal Identification System

The current U.S. traceability infrastructure falls short of the long-term 48-hour objective envisioned by USDA. Existing tracing programs and services have enabled successful efforts that control present disease risk, but do not always provide complete and timely information. Comprehensive, state-of-the-art solutions, however, are needed to significantly reduce the spread of contagious animal disease and the resulting impact on U.S. agriculture.

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The National Animal Identification System (NAIS), developed in partnership with State animal health authorities, the animal agriculture production industry, and USDA, provides the common data standards required to close traceability gaps. Although the optimal 48-hour window remains a long-term goal, NAIS can enable progress towards improved traceability. NAIS equips animal health officials to know which animals are involved in a disease outbreak, where they are, where they were moved from, and when they were there. Separate databases, including those maintained by the industry and Federal/State animal disease systems, are able to “speak” to each other when essential pieces of information are assembled in a common “language.”



NAIS and Traceability

USDA has published a series of reports that detail NAIS' role in advancing traceability based on existing animal health programs and databases. Taken together, these reports detail participant guidance, technical standards, and NAIS and traceability strategies. Each report is summarized below.

NAIS User Guide

This document provides guidance to producers and owners of animals as well as other sectors involved in the animal agricultural industry on how to participate in NAIS, and how participation will benefit them.

Part I of the User Guide provides a brief overview to familiarize producers with NAIS, its advantages and benefits, and other helpful information concerning its cooperative development and implementation. In Parts II through IV, each of NAIS' components are discussed in greater detail, and "how to" information and resources are provided.

Program Standards and Technical References

This document, which supplements the NAIS User Guide, establishes data standards for NAIS. Use of these standards by States, Tribes, industry organizations, identification device manufacturers, and other entities will ensure the system is effective.

Section I lists the following data element formats needed to ensure compatibility across information systems.

- Premises Identification Numbers (PIN) identify where animals are raised, held or boarded
- Animal Identification Numbers (AIN) identify individual animals based on birthplace (premises of origin)
- Group/Lot Identification Numbers (GIN) identify animals that typically move through the production chain in groups

Section II establishes standards for official identification devices that utilize the AIN. Section III provides information on International Organization for Standardization (ISO) standards that are utilized in NAIS.

Advancing Animal Disease Traceability

In the near future, USDA will release the report, "Advancing Animal Disease Traceability." The report details recommended strategies and actions to enable existing State/Federal regulated and voluntary animal health programs, industry-administered animal health and marketing programs, and various animal identification techniques to work in harmony. Although the solution is complex, government and industry will pursue short-term milestones and advance the infrastructure over time. This effort will require cooperation throughout the industry and the participation of individual producers across species.

This report recognizes the need for a comprehensive solution that builds on existing systems. Advancing traceability requires the integration of NAIS data standards across all disease programs in coordination with individual States/Tribes and industry groups. The development, implementation, and expansion of automated data capture and identification technologies will also speed traceability progress.

Key strategies for achieving progress towards a comprehensive traceability infrastructure include:

Strategy 1: Prioritization of Species/Sectors

Prioritization of species/sectors will ensure resources are applied where traceability advances are of the highest importance. "Advancing Animal Disease Traceability" first categorizes species based on existing tracing capabilities and the need for improvement. Priority species include the primary commercial food animal industries – cattle, poultry (chickens and turkeys), swine, sheep, and goats. The competition horse industry is included as a priority due in part to frequent animal movement. Additionally, sectors within each species have been prioritized to direct additional emphasis; for example, the beef and dairy breeding herds are the highest priorities within the cattle sector.

Strategy 2: Harmonization of Animal Identification Systems

The need for unique animal identification in government and industry programs is accelerating. As a result, producers are seeking improved and flexible identification methods, and compatible processes and data standards that may be used for multiple purposes. The harmonization of animal identification systems will result in more cost-effective options benefiting producers while achieving increased animal disease traceability for the entire industry.



Strategy 3: Convergence of Data Standards in Disease Programs and Regulations

USDA will take steps to adopt and apply NAIS data standards to existing disease programs, including international/interstate commerce regulations. For example, national data standards that identify premises importing and exporting livestock, locations participating in official disease control programs, and origin and destination premises listed on Interstate Certificates of Veterinary Inspection (ICVI) will greatly enhance existing animal disease tracing and emergency response capabilities.

Strategy 4: Integration of Automated Data Capture Technologies with Disease Programs

USDA will take steps to integrate electronic data capture and reporting technologies into existing disease programs. By using NAIS-compliant radio frequency identification (RFID) devices and integrating handheld computers/readers to replace paper-based forms, animal health officials will be able to electronically record and submit essential data to the USDA Animal Health and Surveillance Monitoring database and other appropriate animal health databases. The electronic collection of data will increase volume and quality, minimize data errors, and speed data entry into a searchable database.

Strategy 5: State Partnerships

State animal health authorities play a critical role in advancing national animal disease traceability. Working in close partnership with State and Tribal officials, USDA will continue to support the advancement of each State's disease traceability infrastructure. Each State/Tribe will administer and manage localized plans reflecting the animal health priorities in individual regions.

Strategy 6: Industry Collaboration and Sector Opportunities

Achieving traceability objectives requires a partnership between the production sector and animal health officials. Producer organizations, representing member interests, can accelerate the adoption of practices that advance traceability. USDA has entered into cooperative agreements with non-profit industry organizations to promote premises registration within various species groups. Collaboration with USDA accredited veterinarians will enable the delivery of accurate information to clients as well as enhancing the adoption of NAIS data standards in everyday management and disease program activities at the producer level. Additional partnership efforts with industry alliances, service providers, auction markets, feedlots, harvesting facilities, and other industry sectors are a priority for USDA.

Strategy 7: Advancement of Identification Technologies

Continued advancements in traceability require practical, affordable technology solutions that improve efficiency and accuracy of animal ID data collection. USDA will focus its efforts on establishing performance standards for ID devices and evaluating emerging technologies with emphasis on systems that can operate at the "speed of commerce."

